

VERIFICATION REPORT OF LAS PIZARRAS PROJECT

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Normalización y Certificación

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Summary:

Empresa Eléctrica Río Doble S.A. has commissioned the validation/verification body AENOR to perform a verification of VCS Project Activity “Las Pizarras Project” in Perú (hereafter “project activity”) for the period from 30/04/2013 to 30/09/2015.

The project with CDM program was registered on 19/10/2012 under UNFCCC reference number (6967). The starting date of the first crediting period under the CDM is 01/01/2013. The commissioning operating date was on 30/04/2013.

A gap validation with the cover page and sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description Template was validated to comply with VCS rules; therefore, the project activity was registered under VCS with ID 1348. The crediting period for the Project under the VCS is from 30/04/2013 to 29/04/2023. The emission reductions are thus claimed as Voluntary Carbon Units (VCU) and verified on the basis of the Verified Carbon Standard (VCS) version 3.5 for GHG emission reduction and removal projects.

The verification consisted of the following three phases: i) a desk review of the Monitoring Report ii) On-site Visit; iii) the resolution of outstanding issues and internal technical review followed by the issuance of the final verification report and opinion. In the course of the verification process 5 corrective actions and 6 clarifications were raised, all have been successfully closed. The list of Clarification and Corrective Actions Requests (CL and CAR) is presented in Appendix 2.

AENOR confirms that the project is implemented in accordance with the revised VCS-PD, CDM-PDD and the monitoring plan; and then, claimed emissions reductions are calculated without material misstatements.

AENOR has performed the verification of “Las Pizarras Project” on the basis of all issues and criteria of VCS Standard version 3.5 and VCS Program Guide version 3.5 for VCS projects and also on the criteria given to provide for consistent project operations, monitoring and reporting. Hence, in AENOR’s opinion the project correctly applies the baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”; Version 12.3.0 and meets the relevant UNFCCC requirements for the CDM Methodology, Voluntary Carbon Standard requirements and the relevant host country criteria.

Therefore, AENOR is able to certify that the emissions reductions from the “Las Pizarras Project” project during the period from 30/04/2013 to 30/09/2015 amount to 107,925 tonnes of CO₂e.

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1 INTRODUCTION

Empresa Eléctrica Río Doble S.A. has commissioned AENOR to carry out the verification of VCS Project Activity “Las Pizarras Project” in Peru for the period from 30/04/2013 to 30/09/2015. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

The objective of the verification is the review and ex-post determination by a Validation/Verification Body (VVB) of the GHG emission reductions that have been achieved as a result of the implementation of the project during a defined verification period. It includes the determination and evaluation that:

- The project activity has been implemented and operated as per the revised VCS-PD /1/ , CDM-PDD /2/ and that all physical features (technology, project equipment, and monitoring) of the project are in place;*
- The VCS monitoring reports /6/7/ and other supporting documents provided are complete and verifiable and in accordance with applicable CDM/VCS requirements;*
- The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology; and*
- The data is recorded and stored as per the monitoring methodology.*

1.2 Scope and Criteria

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;*
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;*
- to verify that reported GHG emission data is sufficiently supported by evidence.*

The project is assessed against the requirements of VCS Standard, version 3.5 /3/ and VCS Program Guide version 3.5 /4/ for VCS projects. AENOR has conducted the verification based on the recommendations in the latest version of CDM Validation and Verification Standard /5/, and employed a rule-based approach as criteria, focusing on the identification of significant reporting rules and the reliability of project monitoring.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

1.3 Level of Assurance

The verification report is based on the revised VCS-PD, CDM-PDD and the VCS Monitoring Reports (MR) /6/7/, supporting evidences made available to the verifier and information collected through performing interviews and during the on-site assessment.

All the revisions of the verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent AENOR's instructions. The technical review was performed by a technical reviewer(s) qualified in accordance with AENOR's qualification scheme for CDM/VCS validation and verification.

The verification team and the technical reviewers consist of the following personnel:

Name	Position in the team
Freddy Alejandro Garro Flores	Team Leader
Marcelino Pellitero Martinez	Verifier
Luis Javier Arribas Alonso	Technical Reviewer

The verification has been planned and organized to achieve a reasonable level of assurance, with respect to material errors, omissions, and misrepresentations.

1.4 Summary Description of the Project

Las Pizarras project, in Peru, is a run-of-the-river hydropower technology that utilizes the water flow of the Chancay River to generate electricity. The project has an installed capacity of 19.992 MW and generates approximately 106.598 GWh per year. The project employs two new Francis turbines with horizontal shafts and of 10.023 MW each. The plant is connected to the national grid SEIN through 138 kV transmission line to the Espina Colorada sub-station.

Empresa Eléctrica Río Doble S.A. is the implementer and operator of this project.

The project is registered under the CDM scheme. CDM project is registered in UNFCCC on 19/10/2012 with reference 6967 "Las Pizarras Project".

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification was performed through means of the following three phases in accordance with the requirements of the registered VCS-PD, the applied methodology, and the VCS Standard version 3.5 and other relevant VCS requirements.

- I. A desk review of the monitoring report and all support documents.
- II. Follow-up interviews with project stakeholders and site inspection.
- III. The resolution of outstanding issues and the issuance of the verification report and statement.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- The emission reduction calculations and the relevant data records.
- The calibration and maintenance records for the monitoring instruments
- The management systems to support the project operation and monitoring.

2.2 Document Review

The VCS monitoring report final version /7/, and the emissions reductions calculation spreadsheet /8/, were assessed as part of the verification. In addition the revised VCS-PD and CDM-PDD, in particular the baseline estimations and the monitoring plan, the registered CDM validation report /10/ and the VCS Validation Report /9/, as well as relevant documents, was reviewed. A detailed documents reviewed are listed in Annex 1 of the report.

2.3 Interviews

A site visit to the project activity was undertaken from 28/10/2015 to assess the implementation and operation of the project activity; review evidence and interview key personnel to confirm evidence associated with the data generation, emission reduction calculation and reporting of the monitoring parameters.

The key personnel interviewed and the main topics of the interviews are summarized in the table below:

Interviewed organization Person/Position	Interview topics
Las Pizarras Project Ignacio Giménez, Plant Manager Instalaciones Inabensa, S. A. – Zeroemissions Rosa María Pérez Puente, VCS Consultant	• Flows for generating, aggregating and reporting the monitoring parameters. • Crosscheck between information provided in the monitoring report and data from the monitoring system, log books, purchase records, handwritten records.

	• <i>Monitoring report and emission reduction calculations.</i> • <i>Testing of monitoring equipment and observation of monitoring practices.</i> • <i>Calibration of monitoring equipment.</i> • <i>Running of specific checks and trials on data sources and data management practices where non conformities are detected.</i> • <i>Clarifications related to monitoring procedures.</i> • <i>Sufficiency of monitoring plan.</i> • <i>Reliability of internal and external data.</i> • <i>Internal data quality control.</i>
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2.4 Site Inspections

On 28/10/2015, AENOR's verification team carried out an on-site visit. Also, the on-site visit included interviews with key personnel to confirm evidence. The main tasks covered during the on-site visit include, but are not limited to:

- *An assessment of the implementation and operation of the project activity as per the registered VCS-PD.*
- *A review of information flows for generating, aggregating and reporting the monitoring parameters.*
- *A cross-check between information provided in the Monitoring Report and data from other sources such as database, surveys, WBTs or similar data sources.*
- *A check of the monitoring procedure and observations of monitoring practices against the requirements of the VCS-PD, CDM-PDD and the selected methodology.*
- *A review of calculations and assumptions made in determining the GHG data and emission reductions.*
- *An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.*

2.5 Resolution of Findings

As an outcome of the verification process, verification team can raise different types of findings (corrective actions, clarifications or other findings) according to the rules and requirements governing the VCS Program.

A Clarification Request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met; or where a non-conformance arises the verification team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;*
- b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;*
- c) Issues identified in a FAR during verification to be verified during verification have not been resolved by the project participants.*

Forward Action Requests (FARs) are issued for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The project participants were requested to address all verification findings and finally provided the verification team with sufficient evidence to determine that the applicable VCS requirements have been met. The project participant modified the initial monitoring report to resolve the verification team concerns and resubmitted a final version. AENOR has prepared this report based on the final monitoring report.

To guarantee the transparency of the verification process, the 5 CARs and 6 CLs raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the Monitoring report or supporting annexes are documented in the Verification Protocol in Appendix 2.

2.5.1 Forward Action Requests

Project verification resulted without any forward action requests.

2.6 Eligibility for Validation Activities

Not applicable.

3 VALIDATION FINDINGS

The project was validated by AENOR (VCS validation report (report number 2014/144/VOL/29), dated 04/09/2014 /9/) and it was registered under the VCS registration Project ID 1348.

There is a deviation in the project description, which are also assessed as a part of verification. They are explained in the section 3.3 of this report.

3.1 Participation under Other GHG Programs

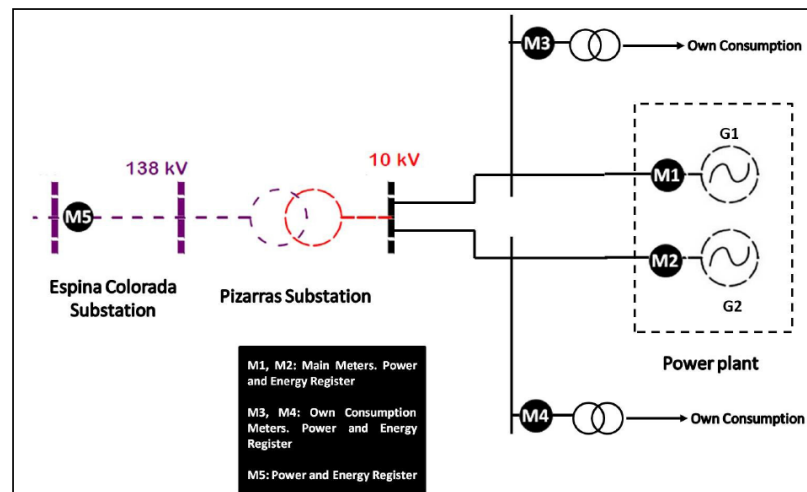
The project activity is also registered under CDM, with reference: Project 6967. Details of the CDM registration is Project title: Las Pizarras Project, registration date 19/10/2012 /11/.

3.2 Methodology Deviations

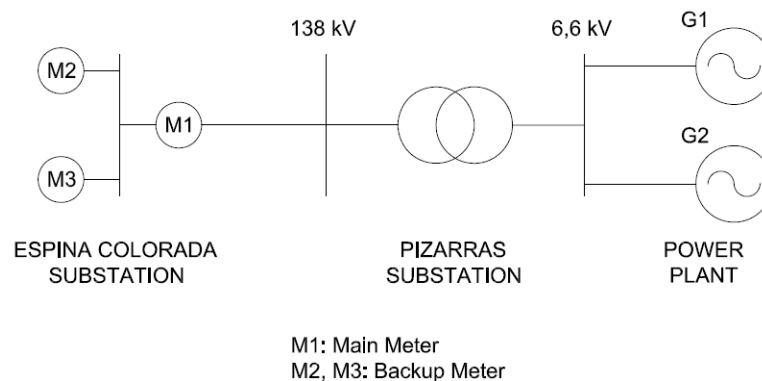
The following methodology deviations related to monitoring plan has been assessed:

Deviation 1: Remove redundant meters and implement a more simply and realistic system

During the verification process the audit team identified that the tentative location of electricity meters stated in the registered CDM-PDD is not in accordance with the current electricity meters installed in the project activity. The registered CDM-PDD indicates following figure:



According to the monitoring report the PP has made the following change of the location of the energy meters in the monitoring plan:



AENOR team requested project participants to provide information in order to explain this deviation. According to the PP, the tentative Meters M1 and M2 (main meters) are redundant, so these have been unified at current M1. In the other hand, tentative M4 and M3 are not considered useful since the current meters are bidirectional, and these measure the value of net electricity to the grid. M5 has been substitute by two backup meters: M2 and M3. According to this explanation the DOE has verified that the deviation to the registered monitoring plan described in the monitoring report, is in compliance with the applied methodology and do not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.

Deviation 2: Organizational Structure

As per the monitoring report, some tasks of the Organizational Structure of the General Manager have been assigned to the Plant Manager as follows:

The Plant Manager supervises the Technical Operators and is responsible for:

- Compile and analyze all the monthly monitoring reports.
- Compile all the calibration certifications.
- Ensure that the Technical Operators are appropriately trained for monitoring/checking the different parameters/meters with training sessions and an instruction manual.

AENOR team confirms that this deviation do not reduce the level of accuracy of the monitoring procedures compared with the requirements contained in the registered monitoring plan.

Therefore, in AENOR's opinion the methodology deviations applied to the project activity are valid and considered more accurate practices for monitoring procedures.

3.3 Project Description Deviations

A visual inspection of the facilities of the project activity was carried out during the on-site visit on 28/10/2015, the audit team identified that the initial design of the project activity has been changed; among others the installed capacity of the project activity has been increased. For this reasons, it is considered that the project implementation is not in compliance with the registered PDD.

According to the registered CDM-PDD, Las Pizarras Project should has been an installed capacity of 18 MW and will generate approximately 103 GWh per year, the design discharge and rated net head should be 22.1 m³/s and 95.67 m respectively.

During the verification process, AENOR team requested project proponent to provide information in order to explain the change of the technical design of the project activity. The following evidence was provided:

- Technical data of generation equipment /14/

- *Studies and Design Revision /22/*
- *Energy production estimation /23/*
- *Invoices of new equipment /24/*

According to the evidence provided by the PP the real installed capacity of the project activity is 19.992 MW with two generators of 9.996 MW and Francis turbines with horizontal shafts of 10.023 MW. Also, the estimated total electricity generation potential is 106.598 GWh per year, turbinable flow rate is 23.2 m³/s and rated net head is 105.35 m.

The project proponent provided a revised VCS-PD and clarified the relevant issues. The AENOR team assessed the revised VCS-PD and clarifications are considered correct as follows:

Assessment on when the changes occurred

The audit team verified that on June 2011, the new generation equipment was invoiced to the supplier. Therefore, the audit team verified that the change of the initial design was carried out by the PP before the registration of the project activity on 19/10/2012.

Reasons for these changes taking place

As stated in the monitoring report, this change occurred during the construction phase when it was detected and mistake in the river daily flow that could produce a reduction on the estimated energy production. In order to get the estimated energy production it was decided to change the turbines previously considered and increment the total installed capacity up to 19.992 MW.

After the registration, PDD was not updated with the current design; and the project owner was not aware about the impacts or relevancies of such change in the technical design of the CDM project activity. The actual change supposes an update of the technical description of the project as compared to the description in the registered CDM-PDD.

Assessment on how the changes would impact the applicability of the methodology, additionality and/or the appropriateness of the baseline scenario

As stated above, the actual changes represent an update of the technical description due to the change of the installed capacity in the registered project activity, and therefore, it does not has adverse impacts on the compliance of the monitoring plan, the applied monitoring methodology and the level of accuracy of the monitoring activity.

On the other hand, the audit team has reviewed the revised PDD against applicable additionality and methodological requirements, and verified that the change would not adversely affect the conclusions of the validation report of the registered PDD with regard to:

- i. Applicability and application of approved baseline methodology under which the project activity has been registered; as the new technical design complies with all applicability criteria of the methodology applied.*

- ii. *Additionality of the project activity; it was based on investment analysis, barrier analysis and common practice. The new technical description represents an additional investment for the project activity. The investment analysis of the project activity presented in the revised VCS-PD /25/ includes the new investment to deal with the change of the technical description. Also, the barrier analysis and common practice are still valid under the new circumstances. The audit team verified that the new investment was updated in accordance with the invoices /24/.*
- iii. *Baseline scenario; there is not impact as the project activity is still a Greenfield.*

Therefore, the project description deviations do not affect the conclusions of the validation report of the registered CDM-PDD and therefore the project remains in compliance with the VCS rules.

3.4 Grouped Project

The project is not a grouped project. Hence this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

AENOR verified that the project is fully implemented according to the description included in the registered CDM-PDD and revised VCS-PD.

The verification team confirmed through visual inspection and document review that all physical features of the VCS project activity, including data collection systems and storage systems have been implemented in accordance with the registered CDM-PDD and revised VCS-PD. The technical specification of the generation equipment /14/, intake diagram /26/ and power house diagram /27/ of the project activity were reviewed and an installed capacity of 19.992 MW was confirmed.

The audit team has confirmed the project started its commercial operations on 30/04/2013 in accordance with Commissioning act /15/ issued by Committee of Economic Operation of System - COES (national dispatch center); therefore, the carbon crediting period and the monitoring starts on same date. The project is completely operational which was confirmed by means of the on-site visit. Neither a notification nor approval of change has been requested to the CDM Executive Board.

During the first monitoring period (30/04/2013 to 30/09/2015), the project has operated satisfactorily, only a significant operation interruption was detected as per incident reports from insurance company and engineering constructor /16/.

The verification team confirmed that the monitoring plan of the validated CDM project activity is in accordance with the applied methodology ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources" version 12.3.0 on the following reasons:

- During the desk review monitoring parameters included in the applied methodology were compared with the ones included in the monitoring plan of the registered CDM-PDD, and they were found consistent.
- During the verification process was identified deviations of the monitoring procedures which are in accordance with applied methodology.
- No other relevant aspects for monitoring not included in the methodology were identified.

In addition, monitoring of reductions in GHG emissions has been implemented in accordance with the monitoring plan. The monitoring mechanism is effective and reliable. In accordance with the monitoring plan, main parameters are as follows:

$EF_{CO2,grid,y}=EF_{grid,CM,y}$: CO2 emission factor of the grid electricity in year y that is equal to combined margin CO2 emission factor for grid connected power generation in year y. The Emission Factor has been calculated following the “Tool to calculate the emission factor for an electricity system”, version 02.2.0.

$EG_{PJ,h}$ and $EG_{PJ,y}$: Electricity displaced by the project activity in hour h of year y: This data is continuously measured and recorded every 15 minutes /28/. Monthly the electricity measured by the meters is cross checked /29/ with reports of active energy transfers provided by COES /17/ and invoices /21/ to ensure consistency.

Furthermore, the meter readings provided by the project participant have been verified against the original reading records downloaded from the COES website, and they were found consistent. No contradictions were found. In order to be conservative, the PP crosschecked the monthly readings with the monthly records for sold of electricity, taking the lower value for ERs calculation.

PP has provided the calibration certificates /18/ that are consistent with the calibration information included in the final monitoring report as follows:

Meter	Type	Serial Number	Accuracy	Calibration date
M1 Main meter	ION 8650	MW-1211A328-01	0.2	20/11/2012 14/09/2013 22/11/2014
M2 Backup meter	ION 8650	MW-1211A330-01	0.2	20/11/2012 22/08/2013 22/11/2014
M3 Backup meter	ION 8650	MW-1205A219-01	0.2	17/05/2012 14/09/2013 22/11/2014

In addition, the calibration frequency is in accordance with the revised VCS-PD which stated that calibration would be done at appropriate intervals according to manufacturer specifications, but at least once in three years. Given that manufacturer specification /19/ doesn't specify any appropriated interval, the calibration is being carried out once each year, complying with the requirements of doing it at least once in three years.

In addition, during desk review and on-site visit was confirmed that the project has not received or sought any other form of environmental credit for the project. Also, it was verified that the project has not been rejected from other GHG program after validation and; therefore, it was not necessary to a complete revalidation of the project against the VCS rules, as stated in paragraph 3 of section 3.11.11 of VCS-Standard.

Overall the project activity was implemented as described in the revised VCS-PD and CDM-PDD. Verification team confirmed that the component project implementation is in accordance with the project description contained in the revised VCS-PD and CDM-PDD. No material discrepancies were identified between project implementation and the project description.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The monitoring has been carried out in accordance with the provision of monitoring plan; the verification team reviewed if:

- *The monitoring of reductions in GHG emissions resulting from the proposed VCS project activity were implemented in accordance with the monitoring plan contained in the revised VCS-PD and CDM-PDD.*
- *The monitoring plan, deviations of monitoring procedures and the applied methodologies had been properly implemented and followed by the project participants.*
- *All parameters stated in the monitoring plan, the applied methodologies and relevant CDM EB decisions had been sufficiently monitored and updated.*
- *The responsibilities and authorities for monitoring and reporting were in accordance with the responsibilities and authorities stated in the monitoring plan and its deviation.*

The monitoring system and all applied procedures are in compliance with deviations of monitoring procedures and monitoring plan contained in the revised VCS-PD and CDM-PDD and the applied methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"; Version 12.3.0, based on the information included in the final monitoring report, there are several procedures for data collecting depending on the methodology applicable for each step of the project.

Based on the information in the registered VCS-PD, the baseline emission factor ($EF_{CO_2,grid,y} = EF_{grid,CM,y}$) was ex-post determined according to "Tool to calculate the emission factor for an electricity system", version 02.2.0 and is calculated annually for the crediting period. The value of baseline emission factors used in the Monitoring Report are as follows:

$$EF_{CO_2,grid,2013} = 0.62828 \text{ tCO}_2/\text{MWh}$$

$$EF_{CO_2,grid,2014} = 0.53258 \text{ tCO}_2/\text{MWh}$$

$$EF_{CO_2,grid,2015} = 0.52321 \text{ tCO}_2/\text{MWh}$$

The different data sources mentioned above permit the comparison of the data and the detection of any deviation between them. In the below table are addresses the values reported and verified for VCUs calculation.

$$EG_{PJ,2013} = 18,392 \text{ MWh}$$

$$EG_{PJ,2014} = 100,659 \text{ MWh}$$

$$EG_{PJ,2015} = 81,728 \text{ MWh}$$

According to the formulae and procedure defined in the monitoring plan the Baseline Emissions (BE_y) is calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

$$BE_{2013} = 18,392.58 \times 0.62828 = 11,555$$

$$BE_{2014} = 100,659.79 \times 0.53258 = 53,609$$

$$BE_{2015} = 81,728.84 \times 0.52321 = 42,761$$

The total Emission Reductions (ER_y) is calculated as follows:

$$ER_y = BE_y - PE_y$$

As per registered CDM-PDD, Project Emissions (PE_y) and Leakage (L_y) are equal to 0, therefore:

$$ER_{2013} = 11,555 \text{ tCO}_2\text{e}$$

$$ER_{2014} = 53,609 \text{ tCO}_2\text{e}$$

$$ER_{2015} = 42,761 \text{ tCO}_2\text{e}$$

The total emissions reductions calculated for the monitoring period are 107,925 tCO₂e.

PP provided the spreadsheets used for calculating the GHG emission reductions. AENOR has reproduced all these calculations to obtain the same results, hence, they are deemed quantified correctly in accordance with the project description and applied methodology; consistent with the evidence provided and cross-checked by AENOR. Furthermore, appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and assumptions and emission factor correctly applied and justified.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

AENOR was able to confirm that the calculations are based on authentic data from energy regulators, on the monthly systematic monitoring of the electricity supplied by the project and records of sold electricity. The spreadsheets used to calculate the VCU calculations and all figures were tracked, checked and found to be consistent. The monitoring information is stored as per the monitoring plan.

The quality of supporting evidences submitted to the VVB for verification is adequate and found to be verifiable. The ER calculation spreadsheet /8/ and other supporting documents /20/ related to quality and maintenance were checked by the verification team during the site visit to confirm the authenticity of the documents and to check the correctness of the calculation.

The verification team can confirm that sufficient evidence is available for the whole monitoring period and the same is verifiable and that the data collection system meets the requirements of the monitoring plan and the applied methodology according to the assessment carried out on site and in the document review.

Verification team confirms that the quality of evidence to determine the GHG reductions and removals produced was found satisfactory. The detailed information flow with the roles and responsibilities of the individuals and the monitoring system have been provided in Appendix 1 of the VCS-MR.

4.4 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

AENOR has performed the verification of the emission reductions that have been reported for the “Las Pizarras Project” (VCS ID 1348) for the period 30/04/2013 to 30/09/2015.

Verification is performed in accordance with the relevant requirements for VCS and CDM rules.

AENOR conducted the verification on the basis of the approved consolidated baseline methodology ACM0002 version 12.3.0, the monitoring plan contained in the registered CDM-PDD and the final monitoring report. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these risks, AENOR planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the reported amount of GHG emission reductions for the period is fairly stated.

It is AENOR's responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 30/04/2013 to 30/09/2015 based on the reported emissions reductions in the Monitoring Report for the same period.

In our opinion the GHG emissions reductions of the “Las Pizarras Project” for the period 30/04/2013 to 30/09/2015 are fairly stated in the final monitoring report.

The GHG emission reductions were calculated correctly on the basis of the approved consolidated baseline methodology ACM0002 version 12.3.0 and the monitoring plan contained in the registered CDM-PDD.

AENOR is able to certify that the emission reductions from the “Las Pizarras Project” during the period 30/04/2013 to 30/09/2015 amount to 107,925 tonnes of CO₂ equivalent, detailed as below.

Verification period: From 30-april-2013 to 30-september-2015

Verified GHG emission reductions and removals in the above verification period:

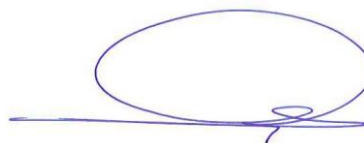
Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2013	11,555	0	0	11,555
2014	53,609	0	0	53,609
2015	42,761	0	0	42,761
Total	107,925	0	0	107,925

Madrid, 04/03/2016



Freddy Alejandro garro flores

Team leader



Luis Robles Olmos

Authorised person

APPENDIX 1: REFERENCE LIST

Ref	Document Name	Date
1	Revised VCS-PD, version 03	21/01/2015
2	Registered CDM-PDD, version 04	16/07/2012
3	VCS Standard, version 3.5	25/03/2015
4	VCS Program Guide, version 3.5	08/10/2013
5	CDM validation and verification standard, version 09.0	25/02/2015
6	VCS Monitoring report, version 01	23/09/2015
7	VCS Monitoring report, version 02	20/10/2015
8	Emission reduction calculation spreadsheet	-
9	VCS Validation Report, version 01	04/09/2014
10	CDM Validation Report, version 01	19/10/2012
11	UNFCCC web page	-
12	CDM Project Standard version 09.0	20/02/2015
13	CDM methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"; Version 12.3.0	02/03/2012
14	Technical data of generation equipment	-
15	Commissioning act issued by COES	30/04/2013
16	Incident reports	2013-2014
17	Reports of active energy transfers provided by COES	2013-2015
18	Calibration certificates of main and back up meters	2012-2014
19	Manufacturer specification of energy meters	-
20	OM factor calculation spreadsheets	-
21	Energy invoices	2013-2015
22	Studies and Design Revision	31/01/2011
23	Energy production estimation	-
24	Invoices of new equipment	2011-2014
25	Updated Cash flow	-

Ref	Document Name	Date
26	Intake diagram	2012
27	Power house diagram	2012
28	Project energy registers every 15 minutes	2013-2015
29	Crosscheck records	-

APPENDIX 2: VCS VERIFICATION PROTOCOL

VCS VERIFICATION PROTOCOL

PROJECT: LAS PIZARRAS PROJECT

MONITORING AND REPORTING PERIOD:

FROM 30/04/2013 TO 30/09/2015

Verification Team: Freddy Garro Flores – Team Leader Marcelino Pellitero Martinez - Verifier	
Version of this Verification Protocol: 03	Date: 04/03/2016

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
1. Project history				
Open issues from validation Check (in case of 1 st periodic verification) whether there are any open issues indicated in the PD validation report (e.g. FAR) Have they been addressed appropriately?	1.1.	All corrective actions and clarifications indicated in the validation report were closed. Validation report does not indicate the existence of open issues.	OK	OK
Open issues from previous verification Check (in case of further periodic verifications) whether there are any open issues indicated in previous verification (FAR) Have they been addressed appropriately?	1.2.	N/A This is the 1 st VCS periodic verification.	N/A	N/A
Requests for Deviations/Revisions of Monitoring Plan Check if there have been any requests for deviations from the monitoring methodology or requests for revisions of the monitoring plan. If any, make sure that they are considered	1.3.	Yes, there is a deviation from the monitoring plan regarding the removal of redundant electricity meters. CAR 1: The PP is requested to clarify if there are other deviations from the monitoring plan. The audit team has detected in the monitoring report that the calibration period, organizational structure and crosscheck procedure have been also changed from the registered PD. If so, the PP shall describe and justify in the monitoring report how these deviations does not negatively impact the conservativeness of the quantification of GHG emission reductions, relates only to the criteria and procedures for	CAR 1	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
during verification		monitoring or measurement, and do not relate to any other part of the methodology. Please see paragraph 3.5 of the VCS Standard. Deviations related to monitoring procedures have been clearly indicated in the monitoring report. The audit team confirms that proposed deviations comply with VCS requirements and have been applied during the monitoring period. CAR 1 is closed. In addition, a project description deviation has been stated in the monitoring report as section below.		
2. Project implementation in accordance with the registered project document and the VCS project description				
Has the VCS project activity been implemented as per the registered VCS-PD?	2.1.	During the on-site visit, the audit team verified facilities and equipment including the sub stations, generation equipment and transmission line are in place and operation during the monitoring period. CAR 2: The audit team has detected that the installed capacity of the project activity has changed from the registered PD. The PP shall describe the project description deviation and explain the reasons for this deviation in the monitoring report. Also, the PP is requested to document the deviation as per procedure of VCS Standard paragraph 3.6.1, procedure 1) shall be applied. Project description deviation has been explained in the final version of the monitoring report. The installed capacity and other technical data have been changes as per initial design stated in registered VCS-PD and CDM-PDD. The audit team confirms that real project description contained in a revised VCS-PD has been assessed and concludes that deviation is appropriately described and justified as per evidence provided by the	CAR 2	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
		PP. Finally, the audit team verified that project activity has been implemented as per the revised VCS-PD. CAR 2 is closed.		
Are all physical features of the VCS project activity proposed in the PD, in place?	2.2.	Yes, all physical features of the project activity are in place.	CAR 2	OK
Have the project participants operated the VCS project activity as per the VCS-PD?	2.3.	Yes, PP has operated the project activity as per the revised VCS-PD.	CAR 2	OK
Actual status of installation works Project installation should be finished at time of initial verification in so far as the project should be ready to generate emission reductions afterwards. It shall be clearly described the starting date of operation and the progress of the project activity? Is the implementation delayed? What were the reasons for the delay?	2.4.	The project installation was finished at the time of initial verification. The project's construction was commenced on 14/04/2011, and the hydropower plant started its commercial operation on 30/04/2013. CL 1: The PP shall provide evidence of the beginning of project's construction and commercial operation. The start date of commercial operation has been clearly stated in the final monitoring report as per evidence provided by the PP. CL 1 is closed.	CL 1	OK
Project boundaries	2.5.	Yes. The project boundaries are in compliance with those indicated in	OK	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Check whether the project boundaries are still in compliance with the ones indicated by the PD.		the VCS-PD.		
On-site visit Was an on-site visit conducted? If not, justify the rationale of the decision.	2.6.	The on site visit was conducted on 28 October 2015.	OK	OK
3. Update on Changes and Incidents (during the Monitoring Period)				
Incidents Identify if there have been any significant incidents, deviant operation modes and/or downtimes of the equipment? Consider e.g. interviews with operational personnel, operational log sheets and analysis of performance data.	3.1.	The audit team has detected only one incident for the operation of the project activity. From 15 June 2013 to 14 November 2013, the power plant was stopped due to the collapse of the headrace tunnel in accordance with technical reports. CL 2: The PP shall clarify the reasons why in the registers of net electricity of the project activity for M1 meter “Pos 103 Pizarras.xls” there are values during the period of 15 June 2013 to 14 November 2013 considering that in the monitoring report is stated that the power plant was stopped. The incident occurred from 15/06/2013 to 14/11/2013 was significant but only stopped the operation for this period and no impact were detected to the generation equipment. CL 2 is closed.	CL 2	OK
Is the information (data and variables) provided in the monitoring report different from	3.2.	The information provided in the monitoring report has not caused an increase in the emission reduction calculation during the monitoring period.	CAR 2	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
that stated in the PD? Has it caused an increase in estimates of the emission reductions in the current monitoring period or is highly likely to increase the estimates of emission reductions in the future monitoring periods?				
Personnel Find out, if relevant monitoring personnel have been exchanged? In case of changes, assure that the implemented monitoring procedures have not been affected.	3.3.	No change of personnel has been detected.	OK	OK
Legislation Find out whether relevant legislation with effect on the project activity in the host country has been changed.	3.4.	No change of legislation has been detected.	OK	OK
4. Monitoring Report – General				
Is the monitoring report (and other supporting documents) provided complete in	4.1.	CAR 3: The PP shall follow the instructions of the VCS-PD form. For example: the date form used in the first page is not correct. Also, in section 1.9 of the monitoring report the PP does not detailed if any	CAR 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
accordance with latest applicable version of the VCS Program Guide?		GHG credits have been claimed under other GHG programs The final monitoring report is complete in accordance with VCS requirements. CAR 3 is closed.		
Is the VCS Monitoring Report Form used by the Project Participants in the monitoring report?	4.2.	Yes, the Monitoring report uses the Monitoring report template version 3.3	OK	OK
Monitoring period Check if the monitoring period is in line with a) the crediting period and/or b) previous monitoring periods?	4.3	CAR 4: The PP shall clearly state in the monitoring report the end of the monitoring period. Yes, the monitoring period is in accordance with the crediting period. CAR 4 is closed.	CAR 4	OK
Transparency Assess if the monitoring report is transparent, i.e. clear and unequivocal	4.4.	Yes, the monitoring report is transparent.	CAR 3 CAR 4	OK
Misstatements on general issues Assess whether the monitoring report is free of material misstatements regarding issues other than the monitoring parameters.	4.5.	The final monitoring report is free of material misstatements.	CAR 3 CAR 4	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Discuss the monitoring parameters in detail in chapter "Monitoring Parameters".				
5. Compliance of the monitoring plan with the monitoring methodology.				
Is the validated monitoring plan of the proposed VCS project activity in accordance with the applied methodology?	5.1.	Yes, the deviation of the monitoring plan is in accordance with the applied methodology.	CAR 1	OK
Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in the case of small-scale methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?	5.2.	No, all the monitoring aspects are specified in the monitoring methodology.	OK	OK
6. Compliance of monitoring with the monitoring plan				
Is the monitoring of reductions in GHG emissions to result from the proposed VCS project activity implemented in accordance with the monitoring plan contained in the PD or the accepted revised monitoring	6.1.	Yes, the monitoring of the emission reductions is in accordance with the monitoring plan.	CAR 1	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
plan?				
Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	6.2.	CL 3: The PP is requested to provide the total calculation spreadsheets for the emission reductions and their respective evidence, also the evidence shall be clearly referenced in the spreadsheets. The calculation spreadsheet shall contain all the registers of the required monitoring parameters in accordance with the monitoring plan covering the monitoring period. The monitoring has been correctly implemented by the PP in accordance with evidence provided to the audit team. CL 3 is closed.	CL 3	OK
Have all parameters stated in the monitoring plan, the applied methodology and relevant CDM Executive Board decisions been sufficiently monitored and updated as applicable (Project emission, baseline emission, leakage, management and operational system and environmental and social parameters)	6.3.	CAR 5: The audit team has revised the calculation spreadsheet for the 2014 emission factor and has found the following issues: • There are references to year 2013 but the calculation is for year 2014, please clarify • The spreadsheet shall include the monitored merit order based on the latest data available of marginal cost for each unit • A power unit is characterized by the fact that it can operate independently of the other power units at the same site; therefore, steam turbines that operate with open cycle turbine shall be considered as a power unit (combined cycle) • Where several fuel types are used by a power unit, use the type with lowest CO2 emission factor for EFCO2,m,i,y. See parameter EFEL,m,y • For the parameter EGn,h used for the calculation of the EFEL,DD,h, the net electricity of the	CAR 5	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
		project activity shall not be used The calculation of the OM factor shall use the latest data available, for example: value of $EG_{n,h}$ for the entire monitoring period The list of parameters fixed and monitored stated in the monitoring report is not in accordance with the monitoring plan and the applied methodology and tool All parameters have been monitored as per the monitoring plan. CAR 5 is closed.		
Are the responsibilities and authorities for monitoring and reporting in accordance with the responsibilities and authorities stated in the monitoring plan?	6.4.	Yes, all responsibilities for monitoring are in accordance with the monitoring plan. In addition, a deviation of the monitoring procedures has been applied during this monitoring period.	CAR 1	OK
7. Monitoring Parameters				
7.1. $EG_{PJ,h}$ and $EG_{PJ,y}$	7.1.	“Electricity displaced by the project activity in hour h of year y”		
Measurement / Determination method Describe how the monitoring parameter was measured / determined. Check if relevant equipment has been exchanged and if in cases of failures / downtimes of	7.1. 1.	This parameter is continuously measured and recorded every 15 minutes. The proportion of data to be monitored is 100% and the data will be archived electronically. Monitoring equipment has not been changes during the monitoring period. The parameter is correctly monitored as per the registered monitoring plan of the PD and the applied methodology.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
standard equipment other measurement / determination methods have been used. Assess whether the measurement or determination method (data generation, frequency, aggregation, equipment, recording, reporting, standards) is in line with the registered monitoring plan of the PD and the applied methodology.				
Monitoring Equipment Is the equipment of used for monitoring (quality, type, accuracy, calibration requirements) in accordance with the relevant guidance provided by the CDM Executive Board and is equipment controlled and calibrated in accordance with the monitoring plan?	7.1. 2.	CL 4: The PP shall provide the calibration certificates of the monitoring meters of the net electricity of the project activity that cover the monitoring period. Yes, the equipment used to monitor these parameters are: main meter M1 and two backup meters M2 and M3. The three meters are class 0.2 (as currently required by national dispatch center). The VCS-PD stated that calibration would be done at appropriate intervals according to manufacturer specifications, but at least once in three years; therefore, calibration is being carried out once each year, according with the applied monitoring methodology. CL 4 is closed.	CL 4	OK
Accuracy In case of measured (or estimated) values, check	7.1. 3.	Inaccuracies were not detected.	CL 4	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.				
Monitoring results Are monitoring results consistently recorded as per approved frequency?	7.1.4.	Yes, the parameter is continuously measured and recorded every 15 minutes.	CL 3	OK
Quality assurance and quality control procedures Have quality assurance and quality control procedures been applied in accordance with the monitoring plan to prevent or identify and correct any errors or omissions in the reported monitoring parameters?	7.1.5.	CL 5: Evidence of the crosscheck shall be provided to the audit team. Monthly the electricity measured by the meters has been cross checked with reports of active energy transfers provided by COES and invoices to ensure consistency. CL 5 is closed.	CL 5 CAR 1	OK
Verification Describe how the value and the information flow (from data generation, aggregation, to recording, calculation and reporting) were verified. Consider the measurement /	7.1.6.	The audit team has verified that value of this parameter for the entire monitoring period and no inconsistencies were found with the raw data of net energy and dispatch center data. Also, crosscheck registers has been revised and the audit team confirm that lower monthly value has been used for the calculation of emission reduction as a conservative approach.	CAR 1 CL 3 CL 4 CL 5	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
determination procedure, accuracies, QA/QC procedure, source and nature of the evidences. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences covering the full monitoring period.				
7.2. $EF_{CO_2,grid,y} = EF_{grid,CM,y}$	7.2	“CO2 emission factor of the grid electricity in year y”		
Measurement / Determination method Describe how the monitoring parameter was measured / determined. Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Assess whether the measurement or determination method (data generation, frequency, aggregation,	7.2. 1.	This parameter has been calculated following the “Tool to calculate the emission factor for an electricity system”, version 02.2.0. No monitoring equipment is used. The parameter is correctly determined as per the registered monitoring plan of the PD and the applied methodology.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
equipment, recording, reporting, standards) is in line with the registered monitoring plan of the PD and the applied methodology.				
Monitoring Equipment Is the equipment of used for monitoring (quality, type, accuracy, calibration requirements) in accordance with the relevant guidance provided by the CDM Executive Board and is equipment controlled and calibrated in accordance with the monitoring plan?	7.2. 2.	Not applicable	N/A	N/A
Accuracy In case of measured (or estimated) values, check whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.	7.2. 3.	Inaccuracies were not detected.	CL 3 CAR 5	OK
Monitoring results	7.2.	Yes, this parameter has been calculated every year.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Are monitoring results consistently recorded as per approved frequency?	4.			
Quality assurance and quality control procedures Have quality assurance and quality control procedures been applied in accordance with the monitoring plan to prevent or identify and correct any errors or omissions in the reported monitoring parameters?	7.2. 5.	Yes, the ex-post calculation has been carried out considering the IPCC data.	CL 3	OK
Verification Describe how the value and the information flow (from data generation, aggregation, to recording, calculation and reporting) were verified. Consider the measurement / determination procedure, accuracies, QA/QC procedure, source and nature of the evidences. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by	7.2. 6.	The audit team verified the calculation of the dispatch data analysis ($EF_{(grid, OM-DD, y)}$), the project developer use the year in which the project activity displaces grid electricity and updated the emission factor annually. Also, the calculation of the $EF_{(grid, BM, y)}$ was revised, option 1 was chosen in the CDM-PDD, therefore the $EF_{(grid, BM, y)}$ does not require monitoring. No inconsistencies were detected against IPCC and COES data.	CL 3 CAR 5	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
corresponding evidences covering the full monitoring period.				
7.3. EG_{m,y} and EG_{n,y}	7.3	“Net electricity generated and delivered to the grid by power plant / unit m or n in year y or hour h.”		
Measurement / Determination method Describe how the monitoring parameter was measured / determined. Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Assess whether the measurement or determination method (data generation, frequency, aggregation, equipment, recording, reporting, standards) is in line with the registered monitoring plan of the PD and the applied methodology.	7.3. 1.	This parameter is directly measured based on the information provided by COES. No monitoring equipment is used. The determination method is in line with the registered monitoring plan of the PD and the applied methodology.	CL 3	OK
Monitoring Equipment	7.3.	Not applicable	N/A	N/A

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Is the equipment of used for monitoring (quality, type, accuracy, calibration requirements) in accordance with the relevant guidance provided by the CDM Executive Board and is equipment controlled and calibrated in accordance with the monitoring plan?	2.			
Accuracy In case of measured (or estimated) values, check whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.	7.3. 3.	Inaccuracies were not detected.	CL 3 CAR 5	OK
Monitoring results Are monitoring results consistently recorded as per approved frequency?	7.3. 4.	Yes, the parameter is continuously measured and at least monthly recorded.	CL 3	OK
Quality assurance and quality control procedures Have quality assurance and	7.3. 5.	None, the data is provided by the COES.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
quality control procedures been applied in accordance with the monitoring plan to prevent or identify and correct any errors or omissions in the reported monitoring parameters?				
Verification Describe how the value and the information flow (from data generation, aggregation, to recording, calculation and reporting) were verified. Consider the measurement / determination procedure, accuracies, QA/QC procedure, source and nature of the evidences. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences covering the full monitoring period.	7.3. 6.	The data used has been checked against information downloaded from national dispatch center (COES). No inconsistencies were found.	CL 3 CAR 5	OK
7.4. $\eta_{m,y}$	7.4	“Average net energy conversion efficiency of power unit m in year y”		

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Measurement / Determination method Describe how the monitoring parameter was measured / determined. Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Assess whether the measurement or determination method (data generation, frequency, aggregation, equipment, recording, reporting, standards) is in line with the registered monitoring plan of the PD and the applied methodology.	7.4. 1.	This data is taken from the latest available Annual Statistics report of the COES. No monitoring equipment is required. The audit team confirms that determination method is in accordance with monitoring plan and applied methodology.	CL 3	OK
Monitoring Equipment Is the equipment of used for monitoring (quality, type, accuracy, calibration requirements) in accordance with the relevant guidance provided by the CDM	7.4. 2.	Not applicable	N/A	N/A

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Executive Board and is equipment controlled and calibrated in accordance with the monitoring plan?				
Accuracy In case of measured (or estimated) values, check whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.	7.4.3.	Inaccuracies were not detected.	CL 3 CAR 5	OK
Monitoring results Are monitoring results consistently recorded as per approved frequency?	7.4.4.	Yes, it was recorded annually.	CL 3	OK
Quality assurance and quality control procedures Have quality assurance and quality control procedures been applied in accordance with the monitoring plan to prevent or identify and correct any errors or omissions in the reported monitoring parameters?	7.4.5.	Yes, they are.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Verification Describe how the value and the information flow (from data generation, aggregation, to recording, calculation and reporting) were verified. Consider the measurement / determination procedure, accuracies, QA/QC procedure, source and nature of the evidences. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences covering the full monitoring period.	7.4.6.	The data has been verified against information published by COES. No inconsistencies were detected.	CL 3 CAR 5	OK
7.5. $EF_{CO_2,i,y}$ and $EF_{CO_2,m,i,y}$	7.5	“CO2 emission factor of fuel type i used in power unit m in year y”		
Measurement / Determination method Describe how the monitoring parameter was measured / determined. Check if relevant equipment has been exchanged and if in	7.5.1.	This parameter is taken from IPCC Guidelines on National GHG Inventories. No monitoring equipment is required. The determination of this data is in accordance with the monitoring plan.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Assess whether the measurement or determination method (data generation, frequency, aggregation, equipment, recording, reporting, standards) is in line with the registered monitoring plan of the PD and the applied methodology.				
Monitoring Equipment Is the equipment of used for monitoring (quality, type, accuracy, calibration requirements) in accordance with the relevant guidance provided by the CDM Executive Board and is equipment controlled and calibrated in accordance with the monitoring plan?	7.5. 2.	Not applicable	N/A	N/A
Accuracy In case of measured (or estimated) values, check	7.5. 3.	Inaccuracies were not detected.	CL 3 CAR 5	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
whether significant inaccuracies occur; in this case, make sure that appropriate discounts have been considered for ER calculation.				
Monitoring results Are monitoring results consistently recorded as per approved frequency?	7.5.4.	Yes, they are.	CL 3	OK
Quality assurance and quality control procedures Have quality assurance and quality control procedures been applied in accordance with the monitoring plan to prevent or identify and correct any errors or omissions in the reported monitoring parameters?	7.5.5.	Yes, they are.	CL 3	OK
Verification Describe how the value and the information flow (from data generation, aggregation, to recording, calculation and reporting) were verified. Consider the measurement /	7.5.6.	The audit team verified this parameter with IPCC default values of the IPCC Guidelines on National GHG Inventories. No inconsistencies were found.	CL 3 CAR 5	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
determination procedure, accuracies, QA/QC procedure, source and nature of the evidences. Consider as well plausibility checks as far as possible. Check if the applied value could be backed up by corresponding evidences covering the full monitoring period.				
8. Compliance with the calibration frequency requirements for measuring instruments				
Has the calibration been delayed and the calibration has been implemented after the monitoring period in consideration (results of delayed calibration are available)? If so, which conservative approach has been adopted: a) Applying the maximum permissible error of the instrument to the measured values taken during the period between the schedule date of calibration and the actual date of calibration, if the	8.1	No delayed calibration has been detected. The meters were calibrated by manufacturer before start of commercial operation and then once every year.	CAR 1 CL 4	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
results of the delayed calibration do not show any error, or if the error is smaller than maximum permissible error, or b) Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error.				
Has the error been applied: a) In a conservative manner, such that the adjusted measured values of the delayed calibration has result in fewer claimed emission reductions?, and b) For all measures taken during the period between the scheduled date of calibration and the actual date of calibration.	8.2	N/A	CAR 1 CL 4	N/A
If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of the verification; has been request to the project participants to conduct the required calibration? If so, has the project participants calculated	8.3	N/A	CAR 1 CL 4	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
the emission reductions conservatively?				
If it is not possible for the project participant to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or registered monitoring plan due to reasons beyond the control of project participants; has been followed the requirements deviations in accordance with VCS Standard?	8.4	N/A	CAR 1 CL 4	OK
If calibration frequency for measuring equipments are not specified neither the monitoring methodology nor the monitoring plan; has the equipments been calibrated in accordance with specifications of the local/national standards, or as manufacturer's specification, or international standards?	8.5	N/A	CAR 1 CL 4	OK
9. Assessment of data and calculation of greenhouse gas emission reductions				

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
It is assessed if GHG emission reductions achieved by the proposed VCS project activity are calculated applying the selected methodology.	9.1.	Yes, they are calculated as per the applied methodology.	CL 3	OK
Is a complete set of data for the specified monitoring period available? Are available evidences sufficient both in terms of frequency and in covering the full monitoring period? Are the source and the nature of evidences identified (external or internal, oral or documented, etc.)?	9.2.	Yes, complete data of monitoring parameters is available for the entire monitoring period.	CL 3	OK
Whether data were not available because activity levels or non-activity parameters were not monitored in accordance with the registered monitoring plan has the most conservative assumption theoretically possible been made?	9.3.	All data was available but conservative assumption was applied by the PP for calculation of emission reductions.	CL 3	OK
Assess if the calculation is fully traceable. In case of complex calculations an Excel	9.4	The calculation spreadsheet provided by the PP is totally traceable.	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
calculation spreadsheet shall be used. All applied formulae must be visible.				
Is the spreadsheet with the emission reductions calculations provided complete?	9.5.	Yes, it is	CL 3	OK
Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	9.6.	Yes, all data of the monitoring report has been crosschecked with official sources.	CL 4	OK
Have calculations of baseline emissions, VCS project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	9.7.	Yes, they are.	CL 3 CAR 5	OK
Have any assumptions used in emission calculations been justified?	9.8.	Yes, all assumption is justified.	CL 3	OK
Have appropriate emission factors, IPCC default values	9.9.	Yes, all emission factors have been correctly applied. Also, most recent	CL 3	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
and other reference values been correctly applied? Are the most recent data incorporated into the calculation of the ex-post grid emission factor?		data is used by the PP.	CAR 5	
10. Quality Management; defined organizational structure, responsibilities and competencies Internal QA/QC and document control				
Management System Have the GHG data monitoring system and all VCS monitoring procedures been implemented? Do they comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology?	10.1 .	Yes, they are.	CAR 1 CAR 5	OK
Roles and Positions Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented, from raw data generation to submission of the final data. Check further if only duly qualified personnel is involved	10.2 .	Yes, all responsibilities are clearly defined. Also, qualification of personnel involved in the monitoring process has been verified during the on site visit.	CAR 1	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
in the monitoring procedures.				
Trainings Check if initial trainings have been carried out, in case deemed necessary.	10.3	CL 6: Evidence regarding training activities relating GHG monitoring shall be provided to audit team Training has been carried out. CL 6 is closed.	CL 6	OK
Troubleshooting procedures Assess whether troubleshooting procedures have been implemented.	10.4	Yes, they are.	CAR 1	OK
Maintenance procedures Are appropriate maintenance procedures in place?	10.5	Yes, they are.	CAR 1	OK
Reporting procedures Check how reports with relevance for the later determination of emission reductions will be generated. Is the frequency of emissions reports established?	10.6	Yes, frequency of monitoring reports are appropriate.	CAR 1	OK
Internal QA/QC Assess whether there are any procedures in place on when, where and how checks and	10.7	Yes, the General Manager of the power plant is responsible for all aspects related to data measurements and the monitoring of data recordings.	CAR 1	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
reviews are to be carried out, and what evidence needs to be documented? (This might include spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.)				
Data collection and data processing systems Check the eligibility of used systems. Does data collection system meet the requirements of the monitoring plan as per the applied methodology?	10.8	Yes, they are.	CAR 1	OK
Data archive Check whether all data of monitoring parameters are recorded and archived according to the monitoring plan and the approved methodology.	10.9	Yes, all data is archived.	CL 3	OK
Data protection	10.1	The access to the databases is controlled and available only for	OK	OK

Checklist Question	Ref	Comments	Draft conclusion	Final conclusion
Assess whether appropriate measures have been take in order to avoid unintended or intended manipulation of the measured data.	0	authorized personnel.		

Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action requests by Verification team	Ref. to table 1	Summary of project owner response	Verification team conclusion
CAR 1: The PP is requested to clarify if there are other deviations from the monitoring plan. The audit team has detected in the monitoring report that the calibration period, organizational structure and crosscheck procedure have been also changed from the registered PD. If so, the PP shall describe and justify in the monitoring report how these deviations does not negatively impact the conservativeness of the quantification of GHG emission reductions, relates only to the criteria and procedures for monitoring or measurement, and do not relate to any other part of the methodology. Please see paragraph 3.5 of the VCS Standard.	1.3	As stated in the PDD the measurement equipment should be calibrated at appropriate intervals according to manufacturer specifications, but at least once in three years. The PP is calibrating the monitoring equipment once per year, and so that, complying with the statements in the registered PDD. It has been explained in the monitoring report, in section 2.2.1, that there has been a change in the organizational structure. This change doesn't impact the conservativeness of the quantification of GHG emission reduction Crosscheck procedures have not been changed from the registered PD. As stated in the registered PDD under the CDM, "Annex 4. Monitoring information", on page 67: the records of the main meters will be cross checked with electricity purchase/sales invoices by comparing the values of the power plant and the substation".	All methodology/monitoring deviation have been clarified in the MR. CAR is closed.
CAR 2: The audit team has detected that the installed	2.1	The project description deviation has been described in the Monitoring report in	The real technical

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capacity of the project activity has changed from the registered PD. The PP shall describe the project description deviation and explain the reasons for this deviation in the monitoring report. Also, the PP is requested to document the deviation as per procedure of VCS Standard paragraph 3.6.1, procedure 1) shall be applied.		Section 2.2.2. "Project Description Deviations", and it has been draft a revised version of the project description, according with the procedures of VCS Standard (paragraph 3.6.1, procedure 1) A new investment analysis has been carried out, taking into account the prices of the turbines and the expected energy generation. The following evidences have been provided to the verification team: - Expected energy generation (PP calculation) - Real turbines invoices - Cost of the turbines in the previous analysis (Ref Doc 17 - Socoin 2011 Studies and Design Revision) - Electricity Price - Peak and Off-Peak at the moment when it was decided this change. (Resolución OSINERGMIN N° 067-2011-OS/CD) The real installed capacity of the project has been indicated in the Monitoring report as per the nominal capacity of the generation units in accordance with the applied methodology	specification of the project has been indicated as per real capacities of the generation units. A revised VCS-PD has been also provided. CAR is closed.

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CAR 3: The PP shall follow the instructions of the VCS-PD form. For example: the date form used in the first page is not correct. Also, in section 1.9 of the monitoring report the PP does not detailed if any GHG credits have been claimed under other GHG programs	4.1	The monitoring report has been modified to follow the instruction of the VCS-PD form. The date form has been changed, and information about credits claimed under other GHG programs has been included.	Instructions have been correctly followed by the PP. CAR is closed.
CAR 4: The PP shall clearly state in the monitoring report the end of the monitoring period.	4.3	The end of the monitoring period has been stated in the monitoring report.	The monitoring period is correct. CAR is closed.
CAR 5: The audit team has revised the calculation spreadsheet for the 2014 emission factor and has found the following issues: - There are references to year 2013 but the calculation is for year 2014, please clarify - The spreadsheet shall include the monitored merit order based on the latest data available of marginal cost for each unit - A power unit is characterized by the fact that it can operate independently of the other power units at the same site; therefore, steam turbines that operate with open cycle turbine shall be considered as a power unit (combined cycle) - Where several fuel types are used by a power unit, use the type with lowest CO₂ emission factor for EFCO_{2,m,i,y}. See parameter EFEL_{m,y} - For the parameter EGN_h used for the calculation of the EFEL_{DD,h}, the net electricity of the project	6.3	All the issues found by the audit team have been revised and modified: - References in the calculation spreadsheets have been updated - The merit order of marginal cost has been included. - Power units operating with open cycle turbine have been considered as a unique power unit. - The lowest CO₂ emission factor has been used for the calculations. - The net electricity generated by the Project activity has been removed from the	The calculation spreadsheets are correct. CAR is closed.

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activity shall not be used - The calculation of the OM factor shall use the latest data available, for example: value of $EG_{n,h}$ for the entire monitoring period - The list of parameters fixed and monitored stated in the monitoring report is not in accordance with the monitoring plan and the applied methodology and tool		calculation of the parameter $EG_{n,h}$. 6. The OM factor for the entire monitoring period (2013, 2014 and 2015) have been calculated with the latest data available. 7. The parameters fix and monitored have been modified in accordance with the monitoring plan and the applied methodology. The order in the thermal plants in the monthly tabs has been modified as per the merit order. The $EFCO_{2,m,i,y}$ for biogas power plants for year 2014, has been modified.	
CL 1: The PP shall provide evidence of the beginning of project's construction and commercial operation.	2.4	Evidences of the beginning of project's construction and commercial operation have been provided to the verification team (works acceptance report of the construction of the access road, and approval of the commercial operation).	CL is closed.
CL 2: The PP shall clarify the reasons why in the registers of net electricity of the project activity for M1 meter "Pos 103 Pizarras.xls" there are values during the period of 15 June 2013 to 14 November 2013 considering that in the monitoring report is	3.1	In the registers of the net electricity provided to the validation team appear not only the generated electricity (kWh rec int), but also the consumed electricity (kWh del int). The fact that the plant was stopped	The PP shall provide the registers of the net electricity for the entire monitoring period (M1, M2 and M3).

Clarifications and corrective action requests by Verification team	Ref. to table 1	Summary of project owner response	Verification team conclusion
stated that the power plant was stopped.		during that period (15 June to 14 November 2013) mean that the plant doesn't consume energy to maintain the installation. The registers of net electricity for the entire monitoring period have been provided to the verification team. The value of net energy has been modified according the energy transfer reports and the monitoring period.	CL is closed.
CL 3: The PP is requested to provide the total calculation spreadsheets for the emission reductions and their respective evidence, also the evidence shall be clearly referenced in the spreadsheets. The calculation spreadsheet shall contain all the registers of the required monitoring parameters in accordance with the monitoring plan covering the monitoring period.	6.2	The references to the evidence of the parameters have been included in the emission reduction spreadsheet, and all the parameters required have calculated. Financial data included in the ER spreadsheet were internal information data to calculate benefits from carbon credit. This data have been removed to avoid confusion. The sheet "table dinámica", have been also removed, given that it didn't offer any additional information. The annual emission reduction has been calculated in a conservative way.	The calculation of annual emission reduction of 2013 shall be conservative. CL is not closed.

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CL 4: The PP shall provide the calibration certificates of the monitoring meters of the net electricity of the project activity that cover the monitoring period.	7.1.2	The calibration certificates of the monitoring meters, covering the monitoring period, have been provided to the audit team. The calibration frequency has been clarified in the MR: The PD stated that calibration would be done at appropriate intervals according to manufacturer specifications, but at least once in three years. Given that manufacturer doesn't specify any appropriated interval, the calibration is being carried out once each year, complying with the requirements of doing it at least once in three years, according with the approved monitoring methodology.	The calibration certificates covering the entire monitoring period have been provided. CL is closed.
CL 5: Evidence of the crosscheck shall be provided to the audit team.	7.1.5	The electricity purchase/sales invoices emitted to the SEIN have been provided to the verification team. Each invoice is referenced to a specific report ("active energy transfer report" with a reference number). These reports on the energy transfers have been also provided to the verification team. From November 2014 on, there was a modification on the procedure to calculate the energy transfers. In November it was	Crosscheck has been provided. The lower value is used for the calculation of the ER as a conservative approach. CL is closed.

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		calculated according to the old procedure (provided to the validation team) which stated a loss factor of 1.007. In December it was presented and approved, the new loss factor according to the new procedure (provided to the validation team), which state a loss factor of 0.9974. According to this change, the energy transfer for November increase to 8,170 MWh. In page 4 of the transfer report of December, the modification of energy sales is approved by the COES (report provided to the validation team).	
CL 6: Evidence regarding training activities relating GHG monitoring shall be provided to audit team	10.3	Evidences regarding training activities have been provided to the audit team.	CL is closed.